DOCUMENT RESUME

ED 374 887 PS 022 627

AUTHOR Etemad, Marguerite E.
TITLE The Role of Kinesthetics in Learning: The Importance of Active Engagement and the Connected Process of Reflection.
PUB DATE May 94
NOTE 41p.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Cognitive Development; Cognitive Processes; *Cognitive Style; *Elementary School Students; *Kinesthetic Methods; Language Arts; Learning Activities; Primary Education; Teaching Methods; *Thinking Skills
IDENTIFIERS Active Learning

ABSTRACT

A study examined the effect of a kinesthetic component in instruction on the performances of 16 5- and 6-year-old public school students on a cognitive development test. Eight boys and eight girls were randomly selected and assigned in equal numbers to a treatment group and a control group. The kinesthetic elements consisted of drawing, coloring, making a collage, using pantomime, dramatization, acting out action words, rhythm clapping, and sculpting with clay. It was hypothesized that a kinesthetic form of active engagement would lead to stronger cognitive development. A series of five language arts lessons were taught. The treatment group's lessons included a kinesthetic element. The goals for the five lessons were to help both groups to learn (1) story structure, (2) new concepts through building vocabulary, and (3) the concepts of synonyms and antonyms. Both groups used the same format. The TONI-2 Test of Nonverbal Intelligence: A Language-Free Measure of Cognitive Ability was administered individually to all subjects before and after the series of lessons. The results indicated no statistically significant difference between the two groups. However, there was a slight improvement of cognitive skills when the kinesthetic element was present. Contains 28 references. (WP)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

PS

ED 374 887

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION
CENTER (ERIC)

X This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

THE ROLE OF KINESTHETICS IN LEARNING: THE IMPORTANCE OF ACTIVE ENGAGEMENT AND THE CONNECTED PROCESS OF REFLECTION

By

Marguerite E. Etemad

Dominican College

San Rafael, CA

May, 1994

PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Marguerite E. Etemad

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

Running head: KINESTHETICS IN LEARNING

PS 022627

BEST COPY AVAILABLE

THE ROLE OF KINESTHETICS IN LEARNING:
THE IMPORTANCE OF ACTIVE ENGAGEMENT
AND THE CONNECTED PROCESS OF REFLECTION

By

Marguerite E. Etemad

Dominican College

San Rafael, CA

May, 1994

Running head: KINESTHETICS IN LEARNING

"Tell me, I forget.

Show me, I remember.

Involve me, I understand."

Ancient Chinese Proverb

Acknowledgements

I wish to thank the following people for their support and professional assistance in the preparation of this study. Dr. Barry A. Kaufman, offered his excellent advice and encouragement. Dr. Madalienne Peters gave her steadfast assistance in all phases of this endeavor. I could not have done it without her help. Sandy Dorward, kept her friendship and faith in me as an educator. RoseMarie Etemad-Green and Dr. Mike Green, gave their emotional support, helped me to retain my sense of humor, and gave their valuable assistance in choosing appropriate children's stories. Dr. Galen A. Etemad , and Jaleh Etemad, gave their love and support on all levels. I truly could not have accomplished this without them. Jenna Hagen and Jason Etemad-Lehmer, proofread my work, listened patiently while I thought out loud, provided gentle, loving, supportive criticism, and put up with me during all of this, they are the best daughter and son a mother could wish for. The Corcorans, Father Albert C. S.J., Ph..D., Helen, and Edna, offered friendship, emotional support, and kept their confidence in me. Their faith in me made all the difference. Doris K. Johnson J.D., the best mother a daughter could wish for, taught me to think through my ideas by playing the devil's advocate. Staff and students where I did my study, for making this possible. My fellow graduate students who listened and provided constructive feedback. And to

all my friends who supported me emotionally, contributed ideas for this thesis, read this while in process, provided feedback, and waited patiently for me to resume an active role as a friend after completing this. I thank them all. No one does anything alone and I am grateful for all the energy and love given to me to help me accomplish this major passage.

Table Of Contents

Acknowledgements	3
Abstract	6
Introduction	7
Statement of the Problem	8
Rationale	8
Background and Need	10
Hypothesis	13
Review of the Literature	13
The Importance of Integrated Learning	13
Studies Relating to Kinesthetic Learning	17
Using Drama and Movement in Learning	21
Methodology	25
Subjects	25
Materials	26
Procedure	26
Results	32
Discussion	34
References	37

Abstract

This study examined the role kinesthetics play in learning. The importance of active engagement and the connected process of reflection, and how they affect cognitive development. This study examined the difference in scores on the TONI-2, a test of cognitive abilities, between subjects given lessons with and without a kinesthetic element. In this study the kinesthetic element involved the use of pantomime, dramatization, rhythm clapping, drawing, collage, and sculpture. The subjects were 16 students, 8 boys and 8 girls, between the age of 5 and 6 years in a combined kindergarten and first grade class. The methodology used was a pretest, posttest, experimental design. Results reported as simple means indicated that cognitive skills improved slightly when the kinesthetic element was present.

The Role of Kinesthetics in Learning: The Importance of Active Engagement and the Connected Process of Reflection

Introduction

Students who are actively engaged in their own learning tend to retain and grasp information better than those who process information only through visual or auditory channels. To teach a young child the concept of hot and cold one needs to demonstrate the reality of those concepts. The child needs to experience hot and cold first hand. This enables the child to completely understand the concepts of hot and cold. We know this by observing children's subsequent behavior in the way they avoid the stove, or use hot and cold water faucets. This theory applies to academic learning. Teaching strategies need to incorporate art, movement, drama, music, a component that involves body motion rather than relying solely on visual and auditory means. When the child has the opportunity to become actively engaged by using one of these components in connection to the subject being studied, the child's level of understanding will be increased.

Statement of the Problem

This study focuses on the effect of a kinesthetic component in instruction on the performance of 5 and 6 year olds on a cognitive development test. For the purpose of this study the term kinesthetic is defined as that which engages the body. The elements used in this study were pantomime, dramatization, rhythm clapping, drawing, collage, and sculpture. Cognitive development refers to general thinking skills; the ability to recognize order and patterns, to see what belongs, and/or should logically follow.

Rationale

Piaget's research shows us that one of the main influences on the young child's development is direct experience with objects. The child learns by observing, although it is next to impossible to learn by observation alone (Ginsburg & Opper, 1969). Piaget calls this operative learning, which is when the child's intelligence is actively engaged by the materials with which he or she interacts. The child has to construct the concept in order to understand it (Elkind, 1976).

According to Piaget, children require concrete activity in order for genuine learning to take place. He feels that the central goal of education is to create men and women who are able to do new things rather than merely repeating what has been done. In order to accomplish this, it is crucial to have students actively

engaged in their own learning, in the process of discovery; both through their own spontaneous activity and through using materials which are set up for them. It is through these direct experiences that they are able to tell what is true and what is simply their first thought on the subject (Ginsburg & Opper, 1969).

Piaget (1969) also points out that new methods in education were not the result of one isolated person, but came into being on many fronts at the same time. This was because of a general change in ideas concerning human personality. These ideas caused many to simultaneously look at childhood in a new way. Many of these discoveries were ideas proposing that students learn more when doing work where they have interest, and the idea that activity provides training for thought.

Montessori (1966) also places a strong emphasis on physical activity or movement in its relationship to learning. She feels that it is through movement that the child acts upon his or her external environment and receives internal impressions.

> Movement, or physical activity, is thus an essential factor in intellectual growth, which depends upon the impressions received from outside. Through movement we come in contact with external reality, and it is through these contacts that we eventually acquire even abstract ideas.

> Physical activity connects the spirit with the world, but the spirit has need of action in a twofold sense, to acquire concepts and to express itself exteriorly. (Montessori, 1966, p. 97).

Montessori's (1967) work shows us that the brain, sensory organs, and muscles must all co-operate. In order for an activity to be perfected, movement is needed to complete the cycle. Mental development must be connected to movement; it is dependent on it. It is of great importance that people involved in promoting educational theory and practice understand this idea. Movement affects mental development itself, providing that the action taking place is connected to the mental activity that is taking place.

Montessori (1967) continues to say that observation confirms this, that the development of the child's mind comes through movement. It is also obvious that the child uses movements to increase understanding. The child's intelligence will develop at a much higher level with movement and the use of his or her hands than it would without them.

Background and Need

The work that has been done in the early childhood educational program at Reggio Emilia in Italy, has demonstrated the effectiveness of children's active engagement in their own learning (Edwards, Gandini, & Forman, 1993). Reggio's

practice of having children constantly revisiting their experience is a key element of this system. This consistent practice of reflection, taking the time to revisit the experience in different ways and from different angles, allows the child to see what more is needed. They can then make the necessary changes themselves. By transferring information from one language to another, going from the verbal to the graphic and back again, the child's understanding increases. The significant aspect here is that the child does something first in one language and then looks at it again in a different language. This allows the child to work in more than one modality and or intelligence, increasing the likelihood of comprehension and cognitive development. The child, by doing this, reflects on the experience in a new way. This enables the child to make connections themselves and to see what else is needed without being given the answer.

Forman (speaker, January 15, 1994) refers to learning through the use of graphic representation as "drawing to learn". He tells us that one work of art is a catalyst for discussion which in turn is a catalyst for another work of art. He goes on to say that it is not experience itself that we learn from, but reflection upon that experience that is our teacher.

Forman (Edwards, Gandini, & Forman,1993) indicates that children draw not only to show what they already know, but also to reflect on and question their

own knowledge. Essentially they represent their knowledge in order to improve their understanding of it. Drawing for them is done to learn, not in order to communicate.

In Reggio Emilia teachers feel it is important that the child also uses media that has consequences, that is not as open-ended as graphic representation such as a simulation of an experience, that is, sifting flour over blocks to gain an understanding of what happens when it snows. From this experience the child can then return to graphic representation. This process of going from one to the other and back again, helps the child to consolidate his or her knowledge and understand what were previously held misconceptions (Edwards, Gandini, & Forman, 1993).

Mallaguzzi, the founding father of innovative preschools in Reggio Emilia, addressed the importance of going from verbal discussion to graphic representation in order for the child to develop his or her ideas. He tells us that it is essential. It is in this manner that children negotiate their ideas and attain clarification. The Hundred Languages of Children is the way he refers to the many ways in which a child can communicate (Gandini, speaker, February 12, 1994).

In conclusion, in Reggio Emilia preschools, art, movement, drama, dance, and other hands on activities are not viewed as separate areas of the curriculum. Instead they are seen as an integral part of the developing child's learning. Art is

not seen as just an aesthetic, it is seen as a thinking tool (Edwards, Gandini, & Forman, 1993).

Hypothesis

If it is true that a kinesthetic form of active engagement leads to stronger cognitive development, then students who receive instruction with active engagement will score higher on a test of cognitive abilities than students who receive instruction only through auditory or visual modes.

Review of the Literature

The Importance of Integrated Learning

Root-Bernstein, (1987) questions the belief that specialization in one area of study should begin as early as possible. He believes that there are skills common to all disciplines which underlie imaginative thought. He feels we need a change of perspective on education that reflects this belief if we want to truly educate the intellectual leaders of tomorrow.

He illustrates this through a series of riddles which ask what many of the most successful individuals have in common. He gives evidence that a combination of knowledge in diverse fields is the norm for the most creative people. He notes that the most creative people are polymaths, people of extensive learning. He identifies over one hundred eminent scientists who were artistically

talented, another hundred who were musically talented, and another hundred who were gifted writers. He has documented that in many of these cases these other endeavors were sources of skills that they used in their scientific careers. Through another series of riddles, he shows us artists, musicians, and writers, who have extensive knowledge in mathematics and or the sciences.

He feels a relationship exists between success in one area and talent and knowledge in another. In fact, he feels it is essential to their creative insight. They utilize knowledge from one discipline to understand another.

Key skills that he mentions are the ability to visualize and to think kinesthetically. He calls these "tools of thought", and clearly names twelve of them:

> (a) pattern recognition; (b) pattern forming; (c) analogizing; (d) abstracting; (e) mental visualization; (f) physical modeling; (g) kinesthetic thinking; (h) aesthetics; (i) playacting or internalizing (imagining oneself as an object); (j) manipulative skill (e.g. hand-eye coordination); (k) playing (as in experimenting: trial and error) and; (l) transformational thinking. (Root-Bernstein, 1987, p. 20).

He notes that none of these are of use unless one can communicate them. For this he names five more skills: "(a) verbal communication; (b) mathematical

communication; (c) visual communication; (d) aural communication; (e) kinesthetic-tactile communication." (Root-Bernstein, 1987, p. 20).

His point is that creative people use whole areas of intelligence and are able to mix them in unusual and interesting ways. Therefore, we must provide an education for students that integrates these thinking tools. If we are to solve the world's problems, we must be whole women and men not divided or separated into categories (Root-Bernstein, 1987).

Fowler (1990) points out that Gardner's theory of multiple intelligences justifies a larger role for the arts in education. This theory shows us the need to educate students in ways that allows them to use their individual strengths. The arts, which use more than one form of intelligence, can provide another way for students to discover and therefore learn. This discovery goes beyond the boundaries of linear logical thinking and provides students with the opportunity to experience their learning in a different way increasing the likelihood of understanding and awareness.

Gardner (1982) talks about a window of creativity and expressiveness which presents itself in early childhood up until about the age of six or so. He notes that this creativity is not as evident once the child reaches elementary school.

He asks what is the cause of this creativity; is it developmental, or is it in some way affected by schools and the way in which the arts are presented to children?

He also notes that between the ages of five and seven the child moves easily between various mediums, combining them freely. For instance, the child will sing while drawing. He questions what this flowering of capacities means. Do we conclude that the young child is an artist? He feels the child is more interested in producing, having little interest in the end product. Art is somehow essential to the child's psychological well being. The child is trying to make sense of his or her world and artistic modes of expression are an essential part of that process (Gardner, 1982).

Lowenfeld (1957) shows us that the child's general growth is connected to his creative development. It is his conviction that all teachers, not only art teachers, should use creative expression as a primary teaching method.

He feels art education introduced beginning in early childhood will help individual expression and will provide the necessary balance between intellect and emotions. He notes that there is no single art medium to develop creative expression. Instead of relying on one form a teacher should stimulate creativity by providing an environment where the child has the freedom to use his or her own

mode of expression. This can be accomplished by providing a variety of art materials and artistic modes of expression for the child to explore.

Every creative process involves the whole child. Thus art education may be the catalyst which leads to child centered education. This would be a system of education in which the individual and his or her potential is placed above subject matter, and the child's emotional well being is held as important as their intellectual accomplishments (Lowenfeld, 1957).

Studies Relating to Kinesthetic Learning

Blahut and Nicely (1984) feel that schools have a responsibility to assist students in developing positive attitudes towards learning. A student with a positive attitude toward education will not exhibit avoidance behavior. They will be more likely to see a use for their learning and be interested in continuing to learn.

Blahut and Nicely (1984) feel there is a relationship between learner attitude toward the content being studied and the method of instruction used to teach it. The literature shows that learning activities that involve some tactile experience increase the development of positive attitudes toward the content being learned.

The work of Piaget and Gagne (Blahut, & Nicely, 1984) supports the use of tactile learning activities in the classroom. According to Piaget this is particularly important during the first 12 years of the child's life. Gagne feels that this tactile stimulus should be present throughout the child's school years, gaining in complexity as the child grows.

Blahut and Nicely (1984) studied the relationships between attitudes of students towards the subject being studied with and without set tactile-learning activities. The study consisted of a pretest, posttest, control group design. Tests were two questionnaires measuring students' attitudes toward content, one measuring evaluative attitudes and one measuring pleasurable attitudes.

The subjects were fifth grade students, 33 in the control group and 31 in the treatment group. The subject being studied was a unit on landforms. Content was identical for both groups. The treatment group had tactile learning activities involving the use of two three-dimensional models. The control groups method was confined to visual and auditory means of instruction.

The researchers found that there was a significant difference between the evaluative attitudes of the control group and treatment group. Results showed that tactile learning activities increase the value of the content for the learner. While the treatment group's scores concerning pleasurable attitudes were higher,

there was no statistical significant difference found for the pleasurable attitude between the control group and the treatment group. Tactile learning activities alone have no statistically significant effect on the pleasurable value of learning for the learner. However, since a positive relationship was shown, it is felt that this relationship should be examined further.

When these learners' competence was measured on a content test, it was found that the treatment group did better than the control group. This showed a strong positive relationship between learner attitudes and academic performance.

Casale (1982) conducted a study which investigated three approaches to vocabulary acquisition. The three approaches are as follows; a cognitive approach that used dictionary worksheets and was patterned after traditional methods, an affective approach which asked students to establish word meanings based on subjective association and prior experience, and a proprioceptive approach which used kinesthetic activities to supplement visual and auditory stimuli in order to help students internalize the meaning of the word. The kinesthetic method used in this study was pantomime. The subjects were fifth and sixth grade students. Casale found that the proprioceptive method was the most effective, the affective approach was the second most effective method, and the cognitive approach was

the least effective method. He feels educational teaching methods should be redesigned to make use of this information (Casale, 1982).

Duffelmeyer and Duffelmeyer (1979) point out that the way words are learned is important in that it affects how well they are really understood. It is often the case that the knowledge gained by the learner is only the surface meaning of the word and the essential meaning of the word is missing.

One way to avoid this difficulty is to use a method which ties the words to be learned directly to student experiences. This can be difficult to accomplish given the confines of the average classroom. An effective classroom method is short dramatizations, which provide psychological meaning as well as logical meaning. The opportunity can also be presented to discuss why one might use one word over another that means basically the same thing in different social contexts.

Duffelmeyer (1980) conducted a study to test his hypothesis. His hypothesis states that, "...an approach to teaching vocabulary that relies primarily on experience should prove more effective in terms of the acquisition of word meaning than an approach which does not have experience as its focus." (1980, p. 35)

His subjects were 56 college students assigned to four different sections in a reading/study skills course. By random selection two sections were assigned to control and two to experimental groups.

The experimental sections consisted of the students acting out ten investigator prepared skits using words from the comprehension section of the Nelson-Denny Reading Test, Form A. The control sections consisted of a traditional approach to teaching vocabulary using structural analysis, context clues, and dictionary usage. This was accomplished through the use of worksheets. The control group used the same words as the experimental group.

The results showed that the experimental group's means were higher than the control group's means. Thus the data supported his hypothesis. It is his hope that educational practices will incorporate dramatization as an effective means of teaching vocabulary.

Using Drama and Movement in Learning

Yaffe (1989) tells us that drama is an effective teaching tool that can be used at all grade levels and with all populations of students. Drama can increase understanding, develop critical thinking skills, bring books to life, and increase students enjoyment of learning.

In a kindergarten class, students do short improvisations of parts of stories. They take lines from one story and put them in another story whenever and wherever the lines will fit, going back and forth from one story to the other. The students then discuss what happened and why. When you compare and contrast two different stories in this active manner the students are able to understand concepts they would not be able to otherwise comprehend (Yaffe, 1989).

In a fifth grade gifted and talented class students vote on an issue. They are then put in groups and asked to develop the opposite side of the issue to the one they chose. As part of the process they choose a spokesperson and present an argument to the class as a whole. By taking the opposite position and defending it, the students will have to examine their beliefs more closely and come to really know it. As a result, real questioning and argument take place, both on an external and internal level.

In a twelfth grade, at risk class, students are improvising scenes as part of a new playwriting curriculum. This process of writing first without pen, on one's feet, builds self-esteem and self-confidence. Students with low writing skills work first through oral skills, this has the effect of building students' reading comprehension and writing skills.

Drama can also be used to bring learning to life. For instance, in history, a teacher can set up a scene that represents a moment in time from the history text, give the students the opening line, and ask them to improvise the rest. When the scenes or scenes are finished, the teacher then gives time for the students to discuss what they have learned. Through this dramatization and the discussion which follows, the student's understanding of the people history is about, their feelings, and motivations for their actions will increase.

Yaffe feels that while you do not need to be a drama professional to use drama effectively in the classroom you do need to possess an understanding of the art form. Staff development can provide a foundation, teaching basic skills. Time must also be given to find out how to implement these basic skills, what the teachers' needs are, the learners' needs, and how to implement these skills to meet those needs.

Yaffe gives words of encouragement to teachers who might have fears about acting. A person who can speak in front of a group of students already knows a great deal about performing. Confidence in using drama in the classroom can be gained with the desire to learn the new, a sense of adventure, and staff development.

Traditionally rhythm and movement have been limited to the domain of dance. Instead of being confined to the area of dance, rhythm and movement have an important role to play in academic learning. If educators have the strengths and skills necessary, they can use rhythm and movement as effective teaching tools. Rhythm and movement, used in conjunction with an academic learning experience, can facilitate learning by completing the whole experience, and increasing the information available in the learning experience (Aldrich, 1989).

Methods of integrating dance, rhythm, and movement into academic areas vary. One method of integrating these elements is to incorporate folk dances of the area being studied into a social studies unit. In addition, the students use their bodies to represent various towns and countries. This way of presenting material, while more difficult to implement than traditional methods, is more effective in that it provides more ways to experience the material being learned.

Synchronous movement, moving together at the same time with the same rhythm and the same movements, can help students learn to work together by: improving their self-image, creating a sense of belonging through integration with the group, and reducing stress. Aldrich feels that dance is probably the best vehicle for teaching synchronous movement and has many benefits. Through the

dance experience students can gain an understanding of how to work together as a group and learn appropriate ways to respond in social situations.

By integrating dance and other movement techniques into learning you increase the student's ability to remember the material being learned. There is a scientific basis for this. The attention of the brain is effectively gained through movement and the learned experience is aided in registering in long term memory. It is also given an associative handle which can be used to retrieve said memory.

Dance, movement, and rhythm have positive effects when used individually. When integrated with academic learning they are powerful teaching tools. It is important that we see our students and ourselves as whole beings and teach accordingly, combining the kinesthetic and cognitive aspects.

Methodology

Subjects

The subjects were 16 students, ages 5 to 6, in a combination kindergarten first grade class in an open classroom in a Bay Area public school. A total of 8 boys and 8 girls were randomly selected for participation in this study. The children were assigned to a Treatment Group and a Control Group, with an equal number of boys and girls in each group.

Materials

Test:

The TONI-2, Test of Nonverbal Intelligence: A Language-Free Measure of Cognitive Ability, Second Edition, was administered individually to all subjects twice. The TONI-2 has two equivalent forms, is appropriate for subjects age 5.0 years through 85.11 years, and was normed on a large representative sample of over 2,500 subjects. In addition the relationship of the TONI-2 to other tests, including the WISC-R has been established. The TONI-2 is published by Pro-ed. Form A was used as a pretest, and Form B as a posttest.

Procedure

A series of five Language Arts lessons were taught. The treatment group's lessons had a kinesthetic element attached to their lesson.

The goals for the five lessons for both groups were:

1. To learn the structure of a story: beginning, middle, and end.
2. To learn new concepts through building vocabulary; To understand the concept of synonyms and antonyms.

Both groups used the same format. Children listened as the stories were read to them while they looked at the text and illustrations. Following this portion of the lesson students participated in a discussion, and dictated their responses

which were recorded on large chart paper so that the children could see their words in print. The treatment group had a kinesthetic element attached to each lesson. The kinesthetic elements consisted of drawing, coloring, collage, pantomime, dramatization of the story, acting out action words, rhythm clapping, and sculpting with clay.

Detailed plans for all lessons follow.

Lesson 1:

Goal: To learn the basic structure of a story.

Objective: To be able to name the parts of a story. To be able to change the end of a story.

Format: Ask students if they know the parts of a story. Provide the missing information, describing what takes place in each part, and recording on large chart paper. Ask students to listen for the parts of the story. Read the story Caps For Sale, by Esphyr Slobodkina. Discuss the parts of the story, and ask them to change the ending of this story, discussing how that changes the story. Record the new ending on chart paper. Repeat process with the story Blueberries For Sal, by Robert McCloskey.

Kinesthetic Element: Give students photocopies of the first story that have been glued onto cardboard. Ask students to put the story in order helping them by

asking questions such as; Look at this picture, what part of the story is this? Have the children act out the story, with the teacher acting as narrator. Then refer to chart paper and act out new ending. Repeat process with second story, this time drawing the new ending instead of acting it out. Have children work together in twos or threes to do their drawings. Ask them to tell the whole group about their drawings.

Lesson 2:

Goal: To learn the parts of a story, and understand the concept of order of events; sequence.

Objective: To see the similarities and differences between the two stories by comparing and contrasting them.

Format: First review the parts of a story, beginning, middle, and end, through questioning. Read story Pelle's New Suit, by Elsa Beskow. Discuss what was the beginning, middle, and end of this story. Talk briefly about the order of events, defining this concept by example. Ask students to list the order of events in this story. Record the order on chart paper. Then ask students to listen to the second story looking for the order of events as well as how it is the same or different to the first story. Read A New Coat for Anna, by Harriet Ziefert. Discuss the order in this story. Discuss the similarities and differences between the two stories and

record children's comments. Ask the following questions: Could you mix up the parts of these two stories? Could you put a part from one story in the other story in the right place and would it fit? Why? Why not? Discuss how similar the two stories are and how one line from one story would almost fit in the other story. Ask what would change when you made changes.

Kinesthetic Element: Give students photocopies of first story glued onto cardboard. Have them put the story in the right order helping them through questions. Have them act out story, with teacher acting as narrator. Repeat with second story having them find the right order as a group. Then instead of acting out the second story, ask students to take a panel from the first story and put it in the right place in the second story. First discuss the idea of why one line from one story would almost fit in the other, because the stories are so similar. Do the first panel as a group, discussing how it fits, how it changes the first story, and why.

Lesson 3:

Goal: Concept development; To increase understanding of the meaning of words, antonyms.

Objective: To be able to tell what you would need to do to change a word, to a word with the opposite meaning.

Format: Read the story Quick as a Cricket, by Audrey Wood. Discuss the differences between words with opposite meanings. Tell the children these words are called antonyms. Ask what you would have to do to change one word to a word with the opposite meaning. Record students' ideas on chart paper. Ask students to think about these ideas while they listen to the next two books being read. Read Fast-Slow High-Low by Peter Spier, and Push-Pull Empty-Full by Tana Hoban. Discuss and record students' ideas on what you need to do to change a word to its opposite. Have students dictate sentences describing their words.

Kinesthetic Element: Have children pantomime word meanings. Pantomime the action needed to change a word to a word with the opposite meaning. Have the chart and books from the first part of the lesson available to children. Have children attempt to act out their sentences describing words. Incorporate rhythm clapping for instance in changing the word light to the word dark, have children clap between words, taking turns turning the light on and off.

Lesson 4:

Goal: Concept development; To increase understanding of the meaning of words, synonyms and adjectives.

Objective: To be able to choose an action word, and find different words to describe it that mean essentially the same thing. To write a sentence for each word connecting the word to a character.

Format: Read The Napping House by Audrey Wood. Discuss the idea of different words that mean the same thing using the story as an example. Point out the difference between synonyms and adjectives. Ask students to choose a new word (topic) for a new story. Have them find other words that mean the same thing or describe it. Do this for as many different topic areas as children can think of. Then have children decide together on one topic. Write sentences for those words, connecting each word to a character. Record students' ideas on chart paper. Refer to these sentences as an outline for a new story.

Kinesthetic Element: Have chart paper with students' ideas from the first part of lesson visible. Referring to this, ask students to draw a picture about their story. Have clay available so that student may sculpt after drawing. Ask students to tell about their drawings and their sculptures. Provide technical assistance with the clay as needed, for instance how to join two pieces together.

Lesson 5:

Goal: Concept development; To understand the parts of a story.

Objective: To predict the outcome of a story. To respond to the stories ideas of how to make the world more beautiful.

Format: Review the parts of a story, beginning, middle, and end. Explain what it means to predict the outcome of a story. Read the beginning of the story, Miss Rumphius by Barbara Cooney. Ask for predictions, and record students' ideas on chart paper. Read a little further and ask again for predictions. Continue reading and asking for predictions. Repeat format with the book, The Legend of the Indian Paintbrush by Tomie De Paola. Ask students what they would do to make the world more beautiful? Record their answers. Compare the two stories and explain the meaning of any words that children have questions about.

Kinesthetic Element: Have chart paper from first part of the lesson visible. Read their ideas back to them, discuss, and ask them to draw and / or do a collage, using their ideas as inspiration. Ask them to tell about their drawings and or collages.

Results

The mean and standard deviation for the pretest and the posttest of both the control group and the treatment group were calculated. This data is summarized in the following table.

Pretest and Posttest scores of 5 & 6 year olds

	Pretest	Posttest
Control Group: (N=8)		
Mean	9.25	10.13
SD	2.86	3.55
Treatment Group: (N=8)		
Mean	10.25	11.63
SD	5.87	5.98

It is of note that the treatment group's pretest scores were higher than the control group's pretest scores. Since both groups were randomly selected from the classroom, it is not known what accounts for this difference in pretest scores.

The mean score of the treatment group's posttest was 1.38 points higher than their pretest. The mean score of the control group's posttest was 0.88 points higher than their pretest. The treatment group's increase of the mean was 0.5 of a point higher than the control group's increase of the mean.

These data, while not showing a statistically significant difference do suggest that the hypothesis is correct. It is also important to note that the treatment group's posttest scores were 1.5 points higher than the control group's posttest scores.

Discussion

For the purpose of this study it was hypothesized that a kinesthetic form of active engagement leads to stronger cognitive development. These data in the preceding table lend credence to this hypothesis with the small increase in mean scores reported for the treatment group.

It is possible that the reasons that the difference is slight are because of the small number of subjects in the study and the short duration of the study. Additionally, the treatment group's pretest scores were higher than the control

group's pretest scores. This difference in pretest scores may have confounded the outcome. Another factor is that this study took place in an open classroom. If this study had taken place in a more traditional classroom where there is less opportunity for kinesthetic activities than in an open classroom, the difference in scores might have been greater.

It was my observation that during both the control group's and the treatment group's lessons, the children while listening to the stories being read would spontaneously act out the motions of the story with their bodies. On one occasion a child found an object in the room and physically manipulated that object to illustrate the point being made. On another occasion, a child, when asked a question, instead of responding with words communicated the idea through movement such as pantomime. These responses were not elicited or encouraged by the researcher, but volunteered by the children.

The literature presented in this thesis supports the use of kinesthetics in learning. It shows it is a crucial element in early childhood and while the learner is still at the concrete stage. It also demonstrates its value throughout the learning experience. Even the student who can visualize well on an abstract level has much to gain from a kinesthetic aspect to their learning. Connections can be deepened or made that might not have otherwise been made.

Kinesthetic elements such as art, movement, and drama need to be integrated with academics into the curriculum. When this is done they are tools which the child uses to think and to communicate. They improve the quality of the child's learning experience: Having a positive affect on psychological and emotional well-being, increasing the ability to remember material being learned, and improving the child's attitude toward learning.

The role of kinesthetics in learning is an important issue, one that deserves further investigation. There needs to be a larger study conducted to define the role of kinesthetics in learning. A study in this area might demonstrate to teachers the need to consider the importance of incorporating a kinesthetic element into the curriculum. This would provide children with an opportunity to experience their learning in more than one way. Additionally, it gives the child an opportunity for reflection. It is through this process of active engagement and reflection that the child may gain a deeper understanding of what they are learning.

References

Aldrich, K. R. (1989). Rhythm, movement and synchrony: Effective teaching tools. Journal of Physical Education, Recreation and Dance, 60, 91-94.

Beskow, E. (1929). Pelle's new suit. (M.L. Woodburn, Trans.) New York: Harper & Row.

Blahut, J. M., & Nicely, R. F., Jr., (1984). Tactile activities and learning attitudes. Social Education, 48, 153-158.

Casale, U. P., & Manzo, A. V. (1982) Differential effects of cognitive, affective, and proprioceptive instructional approaches on vocabulary acquisition. (report No. CS OO6 886). (ERIC Document Reproduction Service No. ED 222 879)

Cooney, B. (1982). Miss Rumphius. New York: Viking Press.

De Paola, T. (1988). The legend of the indian paintbrush. New York: G. P. Putnam's Sons.

Duffelmeyer, F. (1980). The influence of experience-based vocabulary instruction on learning word meanings. Journal of Reading, 24(1), 35-40.

Duffelmeyer, F., & Duffelmeyer, B. B. (1979). Developing vocabulary through dramatization. Journal of Reading, 23, 141-143.

Edwards, C., & Gandini, L., & Forman, G. (Eds.). (1993). The Hundred Languages of Children. Norwood, New Jersey: Ablex Publishing Corporation.

Elkind, D. (1976). Child development and education: A Piagetian perspective. New York: Oxford University Press.

Forman, G. (1994, January 15). Drawing to learn. Speaker at Reggio Emilia Seminar at Dominican College, San Rafael, California.

Fowler, C. (1990). Recognizing the role of artistic intelligences. Music Educators Journal, 77(1), 24-27.

Gandini, L. (1994, February 12). The importance of graphic representation; from an interview with Loris Malaguzzi. Speaker at Reggio Emilia Seminar at Dominican College, San Rafael, California.

Gardner, H. (1982). Art, mind, & brain. New York: Basic Books.

Ginsburg, H., & Opper, S. (1969). Piaget's theory of intellectual development: An introduction. Englewood Cliffs, New Jersey: Prentice-Hall.

Hoban, T. (1972). Push-pull empty-full: A book of opposites. New York: Macmillan.

Lowenfeld, V. (1957). Creative and mental growth. (3rd ed.). New York: Macmillan.

McCloskey, R. (1948). Blueberries for Sal. New York: Viking Press.

Montessori, M. (1967). The absorbent mind. (C.A. Claremont, Trans.) New York: Dell. (original work published 1949).

Montessori, M. (1972). The secret of childhood (M. J. Costelloe, S.J., Trans.) New York: Ballantine Books. (Original work published 1966).

Piaget, J. (1970). Science of education and the psychology of the child. (D. Coltman, Trans.) New York: Orion Press. (Original work published 1969).

Root-Bernstein, R. S. (1987). Tools of thought: Designing an integrated curriculum for lifelong learners. Roeper Review, 10(1), 17-21.

Slobodkina, E. (1940). Caps for sale. New York: Harper & Row.

Spier, P. (1972). Fast-slow, high-low: A book of opposites. New York: Doubleday.

Wood, A. (1982). Quick as a cricket. Singapore: Child's Play.

Wood, A. (1984). The napping house. San Diego: Harcourt Brace Jovanovich.

Yaffe, S. H. (1989). Drama as a teaching tool. Educational Leadership, 46(6), 29-32.

Ziefert, H. (1986). A new coat for Anna. New York: Alfred A Knopf.